# REPORT DOCUMENTATION PAGE

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|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------|--------------------------------------|--------------------------------------|--|--|
|                                                          | ,                                                                                                                                                                                                                                | ATE (DD-MM-YYYY) 2. REPORT TYPE |                            | 3. DATES COVERED (From - To)         |                                      |  |  |
| 24-01-2019                                               | <del>)</del>                                                                                                                                                                                                                     |                                 | Final Report               |                                      | 15-Jul-2018 - 14-Jan-2019            |  |  |
| 4. TITLE AND SUBTITLE                                    |                                                                                                                                                                                                                                  |                                 |                            |                                      | 5a. CONTRACT NUMBER                  |  |  |
| Final Repo                                               | rt: 2018 Ionic                                                                                                                                                                                                                   | Liquids Gordo                   | on Research Conference     | e W911                               | 1NF-18-1-0357                        |  |  |
|                                                          |                                                                                                                                                                                                                                  |                                 |                            | 5b. G                                | 5b. GRANT NUMBER                     |  |  |
|                                                          |                                                                                                                                                                                                                                  |                                 |                            |                                      | 5c. PROGRAM ELEMENT NUMBER<br>611102 |  |  |
| 6. AUTHOR                                                | .S                                                                                                                                                                                                                               |                                 |                            |                                      | 5d. PROJECT NUMBER                   |  |  |
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|                                                          |                                                                                                                                                                                                                                  |                                 |                            | 5f. W                                | 5f. WORK UNIT NUMBER                 |  |  |
|                                                          |                                                                                                                                                                                                                                  |                                 |                            |                                      |                                      |  |  |
| 7. PERFOR                                                | MING ORGANI                                                                                                                                                                                                                      | ZATION NAME                     | ES AND ADDRESSES           |                                      | 8. PERFORMING ORGANIZATION REPORT    |  |  |
| Gordon Res                                               | earch Conference                                                                                                                                                                                                                 | es, Inc.                        |                            |                                      | NUMBER                               |  |  |
| 512 Liberty                                              | Lane                                                                                                                                                                                                                             |                                 |                            |                                      |                                      |  |  |
| West Kings                                               | ton, RI                                                                                                                                                                                                                          | 0289                            | 2 -1502                    |                                      |                                      |  |  |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS (ES) |                                                                                                                                                                                                                                  |                                 | SS                         | 10. SPONSOR/MONITOR'S ACRONYM(S) ARO |                                      |  |  |
| \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \                    | Research Office                                                                                                                                                                                                                  |                                 |                            |                                      | 11. SPONSOR/MONITOR'S REPORT         |  |  |
| P.O. Box 12                                              | 2211                                                                                                                                                                                                                             |                                 |                            |                                      | NUMBER(S)                            |  |  |
| Research Triangle Park, NC 27709-2211                    |                                                                                                                                                                                                                                  |                                 |                            | 73567-CH-CF.1                        |                                      |  |  |
| 12. DISTRIE                                              | BUTION AVAIL                                                                                                                                                                                                                     | IBILITY STATE                   | EMENT                      |                                      |                                      |  |  |
| Approved for                                             | public release; d                                                                                                                                                                                                                | istribution is unli             | imited.                    |                                      |                                      |  |  |
|                                                          | MENTARY NO                                                                                                                                                                                                                       |                                 |                            |                                      |                                      |  |  |
|                                                          | The views, opinions and/or findings contained in this report are those of the author(s) and should not contrued as an official Department of the Army position, policy or decision, unless so designated by other documentation. |                                 |                            |                                      |                                      |  |  |
| 14. ABSTRA                                               | лСТ                                                                                                                                                                                                                              |                                 |                            |                                      |                                      |  |  |
|                                                          |                                                                                                                                                                                                                                  |                                 |                            |                                      |                                      |  |  |
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| 15. SUBJECT TERMS                                        |                                                                                                                                                                                                                                  |                                 |                            |                                      |                                      |  |  |
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|                                                          | TY CLASSIFICA                                                                                                                                                                                                                    |                                 | 17. LIMITATION OF ABSTRACT | 15. NUME<br>OF PAGES                 |                                      |  |  |
|                                                          | b. ABSTRACT   c                                                                                                                                                                                                                  | c. THIS PAGE                    | UU                         | OF PAGES                             | 19b. TELEPHONE NUMBER                |  |  |
| UU                                                       |                                                                                                                                                                                                                                  |                                 |                            |                                      | 410-293-6622                         |  |  |
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## **RPPR Final Report**

as of 30-Jan-2019

Agency Code:

Proposal Number: 73567CHCF Agreement Number: W911NF-18-1-0357

**INVESTIGATOR(S):** 

Name: Paul Trulove Email: trulove@usna.edu Phone Number: 4102936622

Principal: Y

Organization: **Gordon Research Conferences, Inc.**Address: 512 Liberty Lane, West Kingston, RI 028921502

Country: USA

DUNS Number: 075712877 EIN: 050300482

Report Date: 14-Apr-2019 Date Received: 24-Jan-2019

Final Report for Period Beginning 15-Jul-2018 and Ending 14-Jan-2019

Title: 2018 Ionic Liquids Gordon Research Conference

Begin Performance Period: 15-Jul-2018 End Performance Period: 14-Jan-2019

Report Term: 0-Other

Submitted By: Nancy Ryan Gray Email: grants@grc.org Phone: (401) 360-1505

**Distribution Statement:** 1-Approved for public release; distribution is unlimited.

STEM Degrees: STEM Participants:

**Major Goals:** Organizing a Gordon Research Conference involves extensive communication with the research community to identify important issues at the frontiers of the field, and solicit suggestions for speakers and discussion leaders to participate in the conference. The Chair then contacts prospective participants to invite them to talk and discuss the nature of their contributions. The Chair then communicates the topics and aims of the conference through web pages, contact with relevant international professional bodies and email to members of the research community around the world to encourage applications for participation in the conference. The Chair is then responsible for assessing and accepting the applications and fielding a host of questions both concerning the technical content and practical aspects of conference participation.

**Accomplishments:** Ionic liquids have been known for over a century, but they spent much of that time in relative scientific obscurity. Yet, beginning around 1998 interest in these unorthodox salts exploded, and in the intervening period some 85,000 papers have been published on the topic – a truly remarkable, near-unprecedented rate of development. During these past twenty years we have accumulated an impressive store of data pertaining to ionic liquids, and we have begun to use them on large scales in 'real-world' applications. Even so, many with experience in the field will attest that what is understood about them is still dwarfed by what is not yet understood. Likewise, the degree to which they have been harnessed in practical applications continues to be dwarfed by their potential for use in others. To move beyond this 'here and now' towards tomorrow, it is vital to appreciate that ionic liquids are not a technological end unto themselves, but rather an enabling technology of truly remarkable scope.

During the 2018 meeting, we addressed challenges the field faces moving forward, and we aimed to help create a vision for meeting them. We discussed critical issues such as how we can harness ILs to improve our prospects for a future powered by greener energy – not only by enabling the more tractable manipulation of biomaterials, but in helping to reduce the environmental impact of hydrocarbon fuels. We asked – and attempted to answer – such questions as whether ionic liquids can make analyses more sensitive, polymers more useful, and working in environmental extremes more readily accomplished. We asked whether physicochemical and computational studies of ionic liquids not only help us to better understand their properties from a conceptual standpoint, but whether they can help us design better ionic liquids for uses of interest. We also asked whether we have 'met a brick wall' in developing new IL ions – especially anions. The talks at this meeting not only answered questions currently being asked but prompted those present to ask new ones. It is in those new questions, and the ideas to which they give birth that the future of the field lies.

## **RPPR Final Report**

as of 30-Jan-2019

**Training Opportunities:** Speakers, discussion leaders, poster presenters and attendees simultaneously contributed to and benefited from the collective skills and experience shared throughout the conference. The funding provided was invaluable to the success of the Conference.

**Results Dissemination:** The final program has been posted on the GRC website.

**Honors and Awards:** Nothing to Report

**Protocol Activity Status:** 

**Technology Transfer:** Nothing to Report

# R

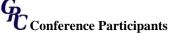
#### GORDON RESEARCH CONFERENCES

FINAL PROGRESS REPORT Army Research Office Ionic Liquids Gordon Research Conference

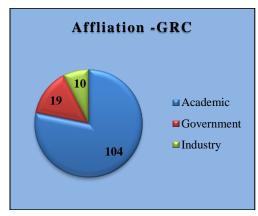
Grant Number W911NF-18-1-0357 August 12-17, 2018

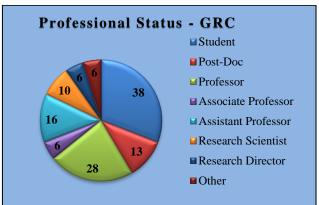
#### **Operational Summary**

The Gordon Research Conference (GRC) on Ionic Liquids was held at the Grand Summit Hotel at Sunday River in Newry, Maine from August 12-17, 2018. The meeting covered a variety of scientific topics and the content presented was highly rated by participants.



The Conference was well-attended with 123 participants. Scientists from academia represented 85% of the participants while attendees from government accounted for 7% and those from industry totaled 8%. The meeting also attracted a strong mix of young investigators and senior scientists. Students and post-docs accounted for 42% of all attendees. Approximately 26% of the participants at the 2018 meeting were women.





#### **Conference Program**

Ionic liquids have been known for over a century, but they spent much of that time in relative scientific obscurity. Yet, beginning around 1998 interest in these unorthodox salts exploded, and in the intervening period some 85,000 papers have been published on the topic – a truly remarkable, near-unprecedented rate of development. During these past twenty years we have accumulated an impressive store of data pertaining to ionic liquids, and we have begun to use them on large scales in 'real-world' applications. Even so, many with experience in the field will attest that what is understood about them is still dwarfed by what is not yet understood. Likewise, the degree to which they have been harnessed in practical applications continues to be dwarfed by their potential for use in others. To move beyond this 'here and now' towards tomorrow, it is vital to appreciate that ionic liquids are not a technological end unto themselves, but rather an enabling technology of truly remarkable scope.

During the 2018 meeting, we addressed challenges the field faces moving forward, and we aimed to help create a vision for meeting them. We discussed critical issues such as how we can harness ILs to improve our prospects for a future powered by greener energy – not only by enabling the more tractable manipulation of biomaterials, but in helping to reduce the environmental impact of hydrocarbon fuels. We asked – and attempted to answer – such questions as whether ionic liquids can make analyses more sensitive, polymers more useful, and working in environmental extremes more readily accomplished. We asked whether physicochemical and computational studies of ionic liquids not only help us to better understand their properties from a conceptual standpoint, but whether they can help us design better ionic liquids for uses of interest. We also asked whether we have 'met a brick wall' in developing new IL ions – especially anions. The talks at this meeting not only answered questions currently being asked but prompted those present to ask new ones. It is in those new questions, and the ideas to which they give birth that the future of the field lies.

#### **Conference Budget**

Funding provided by the Army Research Office supported partial registration for 3 postdocs, 13 graduate students, 10 professors, 3 associate professors, 1 other, 4 assistant professors and 2 research scientists at the GRC.

#### **Conference Feedback**

Participants had an opportunity to provide feedback at the end of the Conference. The feedback collected from the meeting was extremely positive. Evaluations included numerous positive remarks regarding the interactions with experienced investigators, the breadth of topics and the networking opportunities during the poster sessions.

GRC would like to thank the Army Research Office for its continued support of the meetings. The contributions received have been critical to the success of the conferences and are having a measurable impact in advancing the frontiers of science worldwide.

Dr. Jim Davis, GRC Chair University of South Alabama Dr. Paul Trulove, GRC Co-Chair United States Naval Academy

Dr. Nancy Ryan Gray President and Chief Executive Officer Gordon Research Conferences

#### Ionic Liquids Gordon Research Conference

# Ionic Liquids as a Critical Enabling Technology for Meeting Current and Future Needs in Energy, Materials, and Living Systems

August 12 - 17, 2018

Chair- Jim Davis Vice Chair- Paul C. Trulove

Grand Summit Hotel at Sunday River 97 Summit Road Newry, ME, US

#### **Conference Program**

| Sunday              |                                                                                                                                                                                              |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2:00 pm - 9:00 pm   | Arrival and Check-in                                                                                                                                                                         |
| 6:00 pm - 7:00 pm   | Dinner                                                                                                                                                                                       |
| 7:30 pm - 7:40 pm   | Introductory Comments by GRC Site Staff / Welcome from the GRC Chair                                                                                                                         |
| 7:40 pm - 9:30 pm   | All About Synthesis: Making Ionic Liquids and Making Other Materials in Them Discussion Leader: Jamie Ferguson (Emory & Henry College, USA)                                                  |
| 7:40 pm - 7:45 pm   | Introduction by Discussion Leader                                                                                                                                                            |
| 7:45 pm - 8:25 pm   | Anja Mudring (University of Stockholm, Sweden) "Making Ionic Liquids and Using Them as Smart Materials"                                                                                      |
| 8:25 pm - 8:35 pm   | Discussion                                                                                                                                                                                   |
| 8:35 pm - 9:15 pm   | Tamar Greaves (RMIT University, Australia) "High Throughput and Machine Learning Approaches in the Characterization of Neat Ionic Liquids and Their Mixtures"                                |
| 9:15 pm - 9:30 pm   | Discussion                                                                                                                                                                                   |
| Monday              |                                                                                                                                                                                              |
| 7:30 am - 8:30 am   | Breakfast                                                                                                                                                                                    |
| 9:00 am - 12:30 pm  | Ionic Liquids as a Key Element of Batteries and Other Energy Applications<br>Discussion Leader: Hugh De Long (U.S. Army Research Office, USA)                                                |
| 9:00 am - 9:05 am   | Introduction by Discussion Leader                                                                                                                                                            |
| 9:05 am - 9:45 am   | Doron Aurbach (Bar-Ilan University, Israel) "On the Use of Ionic Liquids for High Energy Density Batteries and High Voltage Supercapacitors"                                                 |
| 9:45 am - 10:00 am  | Discussion                                                                                                                                                                                   |
| 10:00 am - 10:30 am | Coffee Break                                                                                                                                                                                 |
| 10:30 am - 11:10 am | Daniel Buttry (Arizona State University, USA) "Electrochemistry in Ionic Liquids for Next Generation Energy Applications"                                                                    |
| 11:10 am - 11:30 am | Discussion                                                                                                                                                                                   |
| 11:30 am - 12:10 pm | Oleg Borodin (U.S. Army Research Laboratory, USA) "Contrasting Bulk and Interfacial Behavior of the Solvent-in-Salt Electrolytes and Room Temperature Ionic Liquids from Molecular Modeling" |
| 12:10 pm - 12:30 pm | Discussion                                                                                                                                                                                   |
| 12:30 pm - 1:30 pm  | Lunch                                                                                                                                                                                        |
| 1:30 pm - 4:00 pm   | Free Time                                                                                                                                                                                    |
| 4:00 pm - 6:00 pm   | Poster Session                                                                                                                                                                               |
| 6:00 pm - 7:00 pm   | Dinner                                                                                                                                                                                       |

| 7:30 pm - 9:30 pm   | The Future of Ionic Liquid Technologies Discussion Leader: William Reichert (University of South Alabama, USA)                                            |  |  |  |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| 7:30 pm - 8:10 pm   | Rui Qiao (Virginia Tech, USA)                                                                                                                             |  |  |  |
| 7.30 pm - 6.10 pm   | "Physics and Applications of Nanoconfined Ionic Liquids in Electrochemical                                                                                |  |  |  |
|                     | Systems"                                                                                                                                                  |  |  |  |
| 8:10 pm - 8:30 pm   | Discussion                                                                                                                                                |  |  |  |
| 8:30 pm - 9:10 pm   | Rasmus Fehrmann (Technical University of Denmark, Denmark)                                                                                                |  |  |  |
|                     | "Ionic Liquids in Catalysis and Gas Separation: Industrial Use and Case Stories"                                                                          |  |  |  |
| 9:10 pm - 9:30 pm   | Discussion                                                                                                                                                |  |  |  |
| Tuesday             |                                                                                                                                                           |  |  |  |
| 7:30 am - 8:30 am   | Breakfast                                                                                                                                                 |  |  |  |
| 9:00 am - 12:30 pm  | Ionomers: Putting Ionic Liquids into Polymers, and Making Ionic Liquids out of Polymers                                                                   |  |  |  |
|                     | Discussion Leader: Gary Baker (University of Missouri, USA)                                                                                               |  |  |  |
| 9:00 am - 9:05 am   | Introduction by Discussion Leader                                                                                                                         |  |  |  |
| 9:05 am - 9:35 am   | Timothy Lodge (University of Minnesota, USA)                                                                                                              |  |  |  |
|                     | "Stimuli-Responsive Block Polymer/Ionic Liquid Systems"                                                                                                   |  |  |  |
| 9:35 am - 9:50 am   | Discussion                                                                                                                                                |  |  |  |
| 9:50 am - 10:20 am  | Alexei Sokolov (University of Tennessee, Knoxville, USA) "Controlling Dynamics and Conductivity in Polymerized Ionic Liquids"                             |  |  |  |
| 10:20 am - 10:30 am | Discussion                                                                                                                                                |  |  |  |
| 10:30 am - 11:00 am | Coffee Break                                                                                                                                              |  |  |  |
| 11:00 am - 11:30 am | Matthew Panzer (Tufts University, USA) "Fully-Zwitterionic Copolymers for Ionogel Battery Electrolytes"                                                   |  |  |  |
| 11:30 am - 11:45 am | Discussion                                                                                                                                                |  |  |  |
| 11:45 am - 12:15 pm | Rhett Smith (Clemson University, USA) "Tetraarylphosphonium Ionic Liquids and Their Incorporation into Ionomers"                                          |  |  |  |
| 12:15 pm - 12:30 pm | Discussion                                                                                                                                                |  |  |  |
| 12:30 pm - 1:30 pm  | Lunch                                                                                                                                                     |  |  |  |
| 1:30 pm - 4:00 pm   | Free Time                                                                                                                                                 |  |  |  |
| 4:00 pm - 6:00 pm   | Poster Session                                                                                                                                            |  |  |  |
| 6:00 pm - 7:00 pm   | Dinner                                                                                                                                                    |  |  |  |
| 7:30 pm - 9:30 pm   | Quo Vadis: Ions for Ionic Liquids from Inexpensive or Renewable Sources<br>Discussion Leader: Scott Handy (Middle Tennessee State University, USA)        |  |  |  |
| 7:30 pm - 8:10 pm   | Jason Hallett (Imperial College London, United Kingdom) "Ionic Liquids from Inexpensive and Readily Available Materials"                                  |  |  |  |
| 8:10 pm - 8:30 pm   | Discussion                                                                                                                                                |  |  |  |
| 8:30 pm - 8:50 pm   | Roland Kalb (Proionic GmbH, Austria) "Ionic Liquids in Industrial Settings"                                                                               |  |  |  |
| 8:50 pm - 9:00 pm   | Discussion                                                                                                                                                |  |  |  |
| 9:00 pm - 9:20 pm   | Peter Von Czarnecki (IoLiTec - Ionic Liquids Technologies, USA) "The Influence of Design and Purity on the Physical-Chemical Properties of Ionic Liquids" |  |  |  |
| 9:20 pm - 9:30 pm   | Discussion                                                                                                                                                |  |  |  |

# Wednesday

7:30 am - 8:30 am Breakfast

| 8:30 am - 9:00 am                         | Group Photo                                                                                               |  |  |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------|--|--|
| 9:00 am - 12:30 pm                        | Ionic Liquids in the Manipulation of Naturally Occurring Materials                                        |  |  |
| 9.00 am - 12.30 pm                        | Discussion Leader: Robin Rogers (The University of Alabama, USA)                                          |  |  |
| 9:00 am - 9:05 am                         | Introduction by Discussion Leader                                                                         |  |  |
| 9:05 am - 9:45 am                         | Luke Haverhals (Bradley University, USA)                                                                  |  |  |
|                                           | "Plant-Based Plastics"                                                                                    |  |  |
| 9:45 am - 10:00 am                        | Discussion                                                                                                |  |  |
| 10:00 am - 10:30 am                       | Coffee Break                                                                                              |  |  |
| 10:30 am - 11:10 am                       | Chieu Tran (Marquette University, USA)                                                                    |  |  |
|                                           | "Behavior of Natural Products in Ionic Liquids"                                                           |  |  |
| 11:10 am - 11:30 am                       | Discussion                                                                                                |  |  |
| 11:30 am - 12:10 pm                       | Gabriela Gurau (525 Solutions, Inc., USA)                                                                 |  |  |
|                                           | "Commercialization of Ionic Liquids as Solvents for Natural Materials Processing"                         |  |  |
| 12:10 pm - 12:30 pm                       | Discussion                                                                                                |  |  |
| 12:30 pm - 1:30 pm                        | Lunch                                                                                                     |  |  |
| 1:30 pm - 4:00 pm                         | Free Time                                                                                                 |  |  |
| 4:00 pm - 6:00 pm                         | Poster Session                                                                                            |  |  |
| 6:00 pm - 7:00 pm                         | Dinner                                                                                                    |  |  |
| 7:00 pm - 7:30 pm                         | Business Meeting Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss        |  |  |
|                                           | Future Site and Scheduling Preferences; Election of the Next Vice Chair                                   |  |  |
| 7:30 pm - 9:30 pm                         | Advancing Analytic Technologies Through Ionic Liquids                                                     |  |  |
|                                           | Discussion Leader: Jared Anderson (Iowa State University, USA)                                            |  |  |
| 7:30 pm - 7:35 pm                         | Introduction by Discussion Leader                                                                         |  |  |
| 7:35 pm - 8:15 pm                         | Scott Shaw (University of Iowa, USA)                                                                      |  |  |
|                                           | "Near-Surface and Extended Structures of Ionic Liquids"                                                   |  |  |
| 8:15 pm - 8:35 pm                         | Discussion                                                                                                |  |  |
| 8:35 pm - 9:15 pm                         | Burcu Gurkan (Case Western Reserve University, USA)                                                       |  |  |
|                                           | "Structuring of Ionic Liquids Around Small Charged Ions and Near Electrodes"                              |  |  |
| 9:15 pm - 9:30 pm                         | Discussion                                                                                                |  |  |
| Thursday                                  | D 16 4                                                                                                    |  |  |
| 7:30 am - 8:30 am                         | Breakfast                                                                                                 |  |  |
| 9:00 am - 12:30 pm                        | What Computation, Spectroscopy and Physicochemical Studies Tell Us About How to Make Better Ionic Liquids |  |  |
|                                           | Discussion Leader: Stephen Paddison (University of Tennessee, USA)                                        |  |  |
| 9:00 am - 9:05 am                         | Introduction by Discussion Leader                                                                         |  |  |
| 9:05 am - 9:45 am                         | Patricia Hunt (Imperial College London, United Kingdom)                                                   |  |  |
|                                           | "Ab Initio Modeling in the Design of Ionic Liquids"                                                       |  |  |
| 9:45 am - 10:00 am                        | Discussion                                                                                                |  |  |
| 10:00 am - 10:30 am                       | Coffee Break                                                                                              |  |  |
| 10:30 am - 11:10 am                       | Olga Russina (Sapienza University of Rome, Italy)                                                         |  |  |
|                                           | "Microscopic Features Affecting Mesoscopic Organization"                                                  |  |  |
| 11:10 am - 11:30 am                       | Discussion                                                                                                |  |  |
| 11:30 am - 12:10 pm                       | Jindal Shah (Oklahoma State University, USA)                                                              |  |  |
| 12:10 nm 12:20 mm                         | "Modulating Self-Assembly in Pure and Mixtures of Ionic Liquids"  Discussion                              |  |  |
| 12:10 pm - 12:30 pm<br>12:30 pm - 1:30 pm | Lunch                                                                                                     |  |  |
| 1:30 pm - 1:30 pm<br>1:30 pm - 4:00 pm    | Free Time                                                                                                 |  |  |
| 4:00 pm - 5:30 pm                         | Poster Session                                                                                            |  |  |
| 4.00 pm - 3.30 pm                         | I OSIGI DESSIUII                                                                                          |  |  |

| 5:30 pm - 7:30 pm | Under Duress: Ionic Liquids and Molten Salts for Utilization in Extreme Conditions Discussion Leader: Allan East (University of Regina, Canada)   |  |  |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 5:30 pm - 5:35 pm | Introduction by Discussion Leader                                                                                                                 |  |  |
| 5:35 pm - 6:00 pm | Kevin West (University of South Alabama, USA) "Thermodynamics and Thermophysical Properties of Thermally Robust Ionic Liquids and Their Mixtures" |  |  |
| 6:00 pm - 6:15 pm | Discussion                                                                                                                                        |  |  |
| 6:15 pm - 6:30 pm | Paula Berton (University of Calgary, Canada)                                                                                                      |  |  |
|                   | "Ionic Liquids: 'Greening' the Oil Sands Extraction Process"                                                                                      |  |  |
| 6:30 pm - 6:40 pm | Discussion                                                                                                                                        |  |  |
| 6:40 pm - 6:55 pm | David Durkin (United States Naval Academy, USA)                                                                                                   |  |  |
|                   | "Preferential Leaching of Metals During Ionic Liquid Processing of Nanoparticle<br>Biopolymer Systems"                                            |  |  |
| 6:55 pm - 7:05 pm | Discussion                                                                                                                                        |  |  |
| 7:05 pm - 7:20 pm | Jesse McDaniel (Georgia Institute of Technology, USA)                                                                                             |  |  |
| 7.03 pm - 7.20 pm | "Collective Processes in Organic Electrolytes: From Dilute Solutions to the Ionic                                                                 |  |  |
|                   | Liquid Limit"                                                                                                                                     |  |  |
| 7:20 pm - 7:30 pm | Discussion                                                                                                                                        |  |  |
| 8:00 pm - 9:00 pm | Dinner                                                                                                                                            |  |  |
| Friday            |                                                                                                                                                   |  |  |
| 7:30 am - 8:30 am | Breakfast                                                                                                                                         |  |  |
| 9:00 am           | Departure                                                                                                                                         |  |  |
|                   |                                                                                                                                                   |  |  |

#### Contributors













University of South Alabama - Office of Research and Economic Development





| Ionic | Lig | uids | (201 | 8) |
|-------|-----|------|------|----|
|       |     |      |      |    |

| ionic Liquius (2018)   |                                                     |                   |
|------------------------|-----------------------------------------------------|-------------------|
| Name                   | Organization                                        | Participation     |
| Arnold, Corey          | University of California - Los Angeles              | Poster Presenter  |
| Basson, Michael        | Nature Medicine                                     | Attendee          |
| Bonato, Paolo          | Harvard Medical School                              | Speaker           |
| Cai, Zhiming           | National Genitourinary Cancer Center                | Speaker           |
| Chang, Anthony         | CHOC Children's                                     | Speaker           |
| Chen, Hao              | Biofourmis                                          | Poster Presenter  |
| Chen, Fei              | Southern University of Science and Technology       | Attendee          |
| Chen, Jun              | Fuzhou University                                   | Attendee          |
| Chen, Jasmine          | Catic Wellness Group, Shenzhen, China               | Attendee          |
| Chu, Maggie            | Hong Kong Science and Technology Parks Corporation  | Attendee          |
| Clifton, David A.      | University of Oxford                                | Speaker           |
| Cui, Xiaoyu            | Northestern University                              | Attendee          |
| Cui, Xingran           | Southeast University                                | Poster Presenter  |
| Deen, Jamal            | McMaster University                                 | Speaker           |
| DeMazumder, Deeptankar | University of Cincinnati                            | Poster Presenter  |
| Ding, Xiaorong         | The University of Oxford                            | Attendee          |
| Fan, Lei               | City University of Hong Kong                        | Attendee          |
| Fotiadis, Dimitrios    | University of Ioannina                              | Speaker           |
| Gu, Zhongze            | Southeast University                                | Discussion Leader |
| Guan, Zhangyan         | City University of Hong Kong                        | Attendee          |
| Han, Xiongqi           | City University of Hong Kong                        | Attendee          |
| Hangjie, Mo            | City University of Hong Kong                        | Attendee          |
| He, Bin                | Carnegie Mellon University                          | Speaker           |
| Heldt, Thomas          | Massachusetts Institute of Technology               | Speaker           |
| Ho, Joshua WK          | Victor Chang Cardiac Research Institute             | Poster Presenter  |
| Ji, Nan                | City University of Hong Kong                        | Attendee          |
| Karlen, Walter         | ETH Zurich                                          | Speaker           |
| Kwon, Hyuksang         | Gwangju Institute of Science and Technology         | Attendee          |
| Lai, King Wai Chiu     | City University of Hong Kong                        | Attendee          |
| Laine, Andrew F        | Columbia University                                 | Discussion Leader |
| Li, Wenyuan            | University of California, Los Angeles               | Poster Presenter  |
| Li, Jiayun             | UCLA Medical Imaging Informatics                    | Poster Presenter  |
| Li, Ye                 | Shenzhen Institutes of Advanced Technology, Chinese |                   |
|                        | Academy of Sciences                                 | Poster Presenter  |
| Lin, Zihong            | City University of Hong Kong                        | Attendee          |
| Lin, Zhuowen           | Southern University of Science and Technology       | Attendee          |
| Liu, Jing              | The Chinese University of Hong Kong                 | Speaker           |
| Liu, Yan               | University of Chinese Academy of Sciences           | Speaker           |
| Lo, Chu-Pin            | Providence University                               | Attendee          |
| Lovell, Nigel          | UNSW Sydney                                         | Discussion Leader |
| Lu, Zuhong             | State Key Laboratory of Bioelectronics, Southeast   |                   |
|                        |                                                     |                   |

|                       | University                                          | Speaker           |  |  |
|-----------------------|-----------------------------------------------------|-------------------|--|--|
| Luo, Tao              | City University of Hong Kong                        | Attendee          |  |  |
| Magjarevic, Ratko     | University of Zagreb                                | Chair             |  |  |
| Meng, Max QH.         | The Chinese University of Hong Kong                 | Discussion Leader |  |  |
| Molina, Alvin Greg L  | The Medical City                                    | Attendee          |  |  |
| Nelson, Bradley J.    | ETH Zurich                                          | Speaker           |  |  |
| Nie, Shuming          | University of Illinois at Urbana-Champaign          | Discussion Leader |  |  |
| Niu, Hongliang        | Huawei Technologies Co., Ltd.                       | Speaker           |  |  |
| Niu, Xinrui           | City University of Hong Kong                        | Poster Presenter  |  |  |
| Noble, Alison         | University of Oxford                                | Speaker           |  |  |
| Ottersen, Ole Petter  | Karolinska Institutet                               | Speaker           |  |  |
| Pan, Tingrui          | University of California, Davis                     | Speaker           |  |  |
| Pang, Zhibo           | ABB Corporate Research                              | Speaker           |  |  |
| Park, Kwang Suk       | Seoul National University                           | Speaker           |  |  |
| Pun, Lodge            | State Key Lab for Analog and Mixed Signal VLSI,     |                   |  |  |
|                       | University of Macau                                 | Speaker           |  |  |
| Qiu, Shirong          | The Chinese University of Hong Kong                 | Attendee          |  |  |
| Quyyumi, Arshed       | Emory University                                    | Speaker           |  |  |
| Rajput, Kuldeep Singh | Biofourmis                                          | Attendee          |  |  |
| Ren, Huamin           | Inmeta Consulting AS                                | Poster Presenter  |  |  |
| Ren, Lei              | Beihang University                                  | Poster Presenter  |  |  |
| Shakoor, Adnan        | City University of Hong Kong                        | Attendee          |  |  |
| Shen, Yajing          | City University of Hong Kong                        | Attendee          |  |  |
| Shi, Peng             | City University of Hong Kong                        | Speaker           |  |  |
| Song, Liang           | Shenzhen Institutes of Advanced Technology, Chinese |                   |  |  |
|                       | Academy of Sciences                                 | Speaker           |  |  |
| Su, Peng              | The Chinese University of Hong Kong                 | Speaker           |  |  |
| Subramaniam, Shankar  | University of California San Diego                  | Speaker           |  |  |
| Sui, Xiaohong         | Shanghai Jiao Tong University                       | Poster Presenter  |  |  |
| Sun, Dong             | City University of Hong Kong                        | Speaker           |  |  |
| Tan, Daxin            | The Chinese University of Hong Kong                 | Attendee          |  |  |
| Tang, Yu              | Huawei                                              | Attendee          |  |  |
| Thakor, Nitish V      | National University of Singapore                    | Speaker           |  |  |
| Tin, Chung            | City University of Hong Kong                        | Attendee          |  |  |
| Wang, Panbing         | City University of Hong Kong                        | Poster Presenter  |  |  |
| Wang, Lan             | CATIC Wellness Group                                | Speaker           |  |  |
| Wang, May Dongmei     | Georgia Institute of Technology / Emory University  | Vice Chair        |  |  |
| Wang, Lipo            | Nanyang Technological University                    | Speaker           |  |  |
| Wang, Lidai           | City University of Hong Kong                        | Speaker           |  |  |
| Wang, Tian            | Fuzhou University                                   | Attendee          |  |  |
| Wen, Guohua           | City University of Hong Kong                        | Poster Presenter  |  |  |
| Wu, Dan               | Shenzhen Institutes of Advanced Technology, Chinese |                   |  |  |

Academy of Sciences

Poster Presenter

Wu, Hongyan Shenzhen Institute of Advanced Technology, Chinese

Academy of Sciences Poster Presenter

Xiao, Peng City University of Hong Kong Attendee

Xiong, Yang City University of Hong Kong Poster Presenter

Xu, DanyingSouthern University of Science and TechnologyAttendeeYan, HongCity University of Hong KongSpeakerYang, Guang-ZhongHamlyn Centre, Imperial College LondonSpeakerYang, QiqiBGISpeaker

Yang, Geng Zhejiang Univ. Poster Presenter

Yang, Xu Fuzhou University Attendee Yang, Po Liverpool John Moores University Speaker Ye, Fuqiang Southern University of Science and Technology Attendee Attendee Yu, Fang Southern University of Science and Technology Yue, Haibing City University of Hong Kong Attendee Zeng, Yuying Huawei Technology Ltd Attendee Zhang, Yu Huawei Company Attendee Zhang, Yuan-Ting City University of Hong Kong Chair Zhang, Jianwei University of Hamburg Speaker

Zhao, Ni The Chinese University of Hong Kong Discussion Leader

Zhao, Yue Northeastern University Attendee
Zhao, Ling City University of Hong Kong Attendee

Zhou, Zhanhong City University of Hong Kong Poster Presenter

Zhu, Tingting University of Oxford Attendee